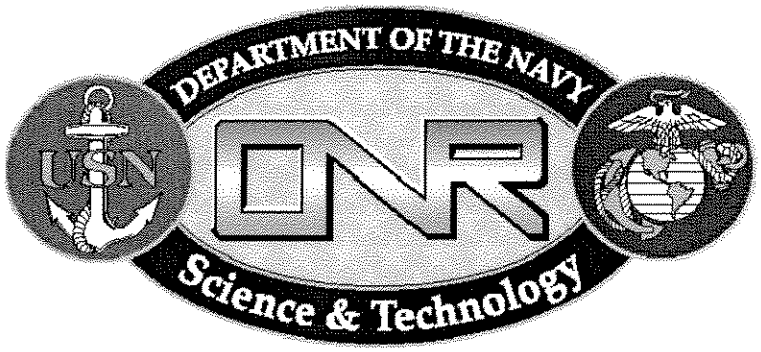
ONR BAA Announcement # 06-011



BROAD AGENCY ANNOUNCEMENT (BAA)

INTRODUCTION:

This publication constitutes a Broad Agency Announcement (BAA) as contemplated in Federal Acquisition Regulation (FAR) 6.102(d)(2). A formal Request for Proposals (RFP), solicitation, and/or additional information regarding this announcement will not be issued.

The Office of Naval Research (ONR) will not issue paper copies of this announcement. The ONR reserves the right to select for award all some or none of the proposals in response to this announcement. The ONR reserves the right to fund all, some or none of the proposals received under this BAA. ONR provides no funding for direct reimbursement of proposal development costs. Technical and cost proposals (or any other material) submitted in response to this BAA will not be returned. It is the policy of ONR to treat all proposals as sensitive competitive information and to disclose their contents only for the purposes of evaluation.

I. GENERAL INFORMATION

1. Agency Name

Office of Naval Research
One Liberty Center
875 N. Randolph Street Suite 1425
Arlington, VA 22203-1995

2. Research Opportunity Title

Compact High-Power-Density Waterjet

3. Program Name

ONR Seabasing FNC Program: EC-1C MEB Force Closure

4. Research Opportunity Number

BAA 06-011

5. Response Date

Full proposals are due by no later than 2:00 pm (Eastern Daylight Time) on 1 May 2006.

6. Research Opportunity Description

Background:

The Seabasing concept has been maturing over the past few years, and a special emphasis has been placed on the development of technologies needed to make it a reality. The Office of Naval Research (ONR) has aligned the Future Naval Capabilities (FNC) programs with the vision of Sea Power 21. Each of these FNCs consists of a number of Enabling Capabilities (EC) that address warfighting capability shortfalls. The Compact High-Power-Density Waterjet Program is under the Marine Expeditionary Brigade (MEB) Force Closure EC in the Seabasing FNC. The objective of this program is to develop an advanced waterjet technology to fill the warfighting capability gap related to *Strategic Mobility to Move Forces Rapidly to the Sea Base*.

Under this BAA, ONR is soliciting proposals for development of a compact high-power-density waterjet for primary transition to the Joint High Speed Sealift (JHSS) ship (formerly known as Rapid Strategic Lift Ship, NAVSEA PMS 325). The primary mission of the JHSS is to transport personnel, aircraft and cargo rapidly from CONUS to Sea Base or austere ports. Other high speed naval ships such as JHSV and LCS could also benefit from this technology.

The compact high-power-density waterjet will enable the use of long slender high-speed hullforms with a narrow beam at the stern while providing the required power to propel the ship at high speeds. Preliminary JHSS concept studies indicated that the power required to propel the ship at sustained speed of 36 knots would be approximately 144 MW. It is estimated that four compact waterjet units, each absorbing maximum power of approximately 40MW, would be required.

Program Plan:

This program consists of two phases (Phase I being Base and Phase II being Option) and is scheduled for completion by the end of FY08. A series of risk reduction demonstrations is planned, ranging from small-scale laboratory demonstrations to a large-scale at-sea demonstration of a prototype waterjet with a 7 – 8 MW power output. The technical content of each phase is described below.

Phase I – Pump Design, Model Scale Fabrication, and Large Scale Demonstration Plan:

During Phase I, the offeror shall design a waterjet pump for operation on a notional monohull JHSS ship, and develop a detailed Phase II proposal. The estimated resistance of the notional JHSS is presented in Table 1 below. The pump will be designed to meet the performance requirements specified below. Phase I is envisioned to span approximately 7 months and may consist of multiple awards for the design and delivery of a scaled waterjet pump model.

The model pump shall be tested by the Government in the 36-inch water tunnel and the Large Cavitation Channel (LCC) of the Naval Surface Warfare Center (NSWC), Carderock Division. The Government anticipates participation by the offeror's representatives during model testing. For both tests the Government will provide pump flange geometry within 60 days after the Phase I award. For LCC testing the Government will also provide the inlet geometry within 60 days after the Phase I award. The test plan includes:

(a) Pump Loop Testing in the 36-Inch Water Tunnel:

- Pump mass flow and head rise measurements (using LDV/PIV and wall pressure taps)
- Rotor shaft thrust and torque measurements
- Cavitation testing: cavitation observations, cavitation inception, cavitation breakdown, and cavitation erosion.
- The above tests will be conducted in a uniform inflow and with an upstream wake screen simulating a notional inflow due to inlet.

(b) Large Cavitation Channel (LCC) Testing:

- Inlet-pump interaction using a Navy specified inlet.
- Pump mass flow and head rise measurements (using LDV/PIV and wall pressure taps)
- Rotor shaft thrust and torque measurements
- Cavitation testing: cavitation observations, cavitation inception, cavitation breakdown, and cavitation erosion.

It is estimated that approximately 5 (five) months will be required to complete the model testing by the Government.

Deliverables for Phase I:

- A model-scale pump including rotor, stator, nozzle, casing, and other related parts so as to constitute a complete pump for testing shall be delivered. The model pump shall be made of high-strength aluminum, brass, or bronze with a 12-inch (30.5 cm) casing inner diameter. Detailed list of deliverables are specified in the *Section VI.2 - Reporting and Deliverables.* (Delivery date: 4.5 months after Phase I contract award)
- Updated and complete Phase II proposal, including large scale demonstration plan shall be delivered. This should include identification of an appropriate demonstration platform*, waterjet installation and operational plan, costs, and schedule. (Delivery date: 7 months after Phase I contract award)
  (*Note: The Government reserves the right to specify the demonstration platform to be used in Phase II.)

Each award for Phase I is estimated to be $550K to $650K.

Phase II - Large Scale (7 – 8 MW) At Sea Demonstration:

Based on the performance results of the small-scale model tests conducted by the Government during Phase I and the updated Phase II proposals submitted by the awardees, the Government will exercise Option under the awarded contracts to select one offeror to perform Phase II. The period of the Phase II Option is envisioned to last 15 months to conduct detailed design, construction, delivery, and installation of a complete 7 – 8 MW large scale waterjet to be tested at sea on a large-scale demonstration platform. The large-scale waterjet design for Phase II should be based upon the Phase I design and should also meet the same performance requirements as adapted to the selected demonstration platform. The awardee for Phase II Option will employ its concept and knowledge gained from Phase I to adapt and optimize its design for operation on the specified demonstration platform. The Government will specify and supply instrumentation for at-sea tests.

The Government anticipates participation by the awardee's representatives during at-sea testing led by the Government. Notional at-sea demonstration plan will include:

- Cavitation viewing for the inception and extent of tip-leakage vortex cavitation and blade surface cavitation. After testing, the individual blades will be inspected for erosion damage.
- Pump pressure measurements, pump head rise, and nozzle jet velocity.
- Pump acceleration levels will be monitored.
- Powering performance, including but not limited to shaft torque, power, and RPM.

Deliverables for Phase II:

- A complete large-scale waterjet (7-8 MW) including rotor, stator, nozzle, casing, steering/reversing hardware, and all other propulsion components. (Delivery date: 12 months after Phase II contract award)
- Installation of the large-scale waterjet onto the selected demonstration platform. (Delivery date: 15 months after Phase II contract award)

The cost for the Phase II Option effort is anticipated to be $2.5M - $3M for delivery and installation of the large-scale waterjet (7-8 MW) plus additional funding to cover other demonstrator costs.

Performance Requirements of the Compact High-Power-Density Waterjet:

1. **Required Thrust**: Total effective power (PE) in calm water as a function of ship speed, V_{ship}, is provided in Table 1 for a notional monohull JHSS ship. It is assumed that the ship will be propelled by four (4) waterjets, each providing ¼ of the total thrust. The waterjet pump shall be designed for a maximum continuous shaft power of 36 MW. Maximum ship speed shall be determined by using the total ship resistance shown in Table 1, and maximum sustained speed shall be defined as the speed achieved in calm water at 85% maximum continuous power.

Table 1: Estimated Effective Power for a Notional Monohull JHSS

Ship Speed Vs (kts)	Effective Power PE (KW)	Effective Power PE (HP)
10	1772	2376
12	3024	4055
14	4752	6373
16	7043	9445
18	10015	13430
20	13752	18442
22	18223	24437
24	23334	31291
26	29354	39364
28	36269	48638
30	43477	58304
32	50136	67233
34	57849	77577
35	63601	85290
36	70966	95167
37	79895	107141
38	90389	121214
39	102955	138065
40	118357	158719

Notes: (1) PE = Total Resistance (R_T) x Ship Speed (V_{ship})
(2) The PE includes the estimated appendage drag, air drag, 8% margin, and the correlation allowance (C_A) of 0.0002.

2. **Specific Diameter**: A "Specific Diameter", defined below, quantifies the waterjet pump power density. The specific diameter, D_s, is defined as:

$$D_s = \frac{D_{ref}(gH)^{0.25}}{Q^{0.50}}$$

where D_{ref} is the reference diameter taken as the max. internal pump diameter,
H is the head rise across the pump,
g is the gravitational acceleration, and
Q is the flow rate.

The specific diameter, D_s, at 36 knots shall not exceed 1.35.

3. **Pump Configuration**: The pump diameter shall be as small as possible while meeting other specified performance requirements. The pump shall have a maximum of two (2) blade rows (1 rotor, 1 stator).

4. **Cavitation**: There shall be no thrust breakdown or cavitation damage with continuous, non-transient, operation in calm water at constant speeds up to that achieved at maximum continuous power of 36MW per pump, or 144MW total for the ship. This condition shall be met if model test results indicate there is less than 1% reduction in pump efficiency due to cavitation within the entire speed range.

5. **Propulsive Efficiency**: Propulsive efficiency shall be made as high as possible while meeting other requirements. Maximum jet velocity ratio, JVR, shall not exceed 2.0 at the design speed of 36 knots, where JVR is defined by V_{jet}/V_{ship}.

6. **Hull – Propulsor Interaction**: The offerors shall use the following values for thrust deduction and wake fraction at the design speed:

$$1\text{-}t = 1.045, \text{ and } 1\text{-}w = 0.90.$$

7. Point(s) of Contact

Questions of a technical nature shall be directed to the cognizant Technical Point of Contact, as specified below:

Science and Technology Point of Contact:

Dr. Ki-Han Kim
Office of Naval Research
Code 331
875 N. Randolph Street Suite 1425
Arlington, VA 22203-1995
Telephone Number: (703) 696 - 4305
Email Address: kimk@onr.navy.mil

Questions of a business nature shall be directed to the cognizant Contract Specialist, as specified below:

Business Point of Contact:

R. Brian Bradley
Contracting Officer
875 N. Randolph Street, ONR 0254
Arlington, VA 22203-1995
Telephone Number: (703) 696-8373
Email Address: brian_bradley@onr.navy.mil

8. Instrument Type(s)

It is anticipated that ONR will award one or more Cost type contracts for this effort.

9. Catalog of Federal Domestic Assistance (CFDA) Numbers

Not Applicable.

10. Catalog of Federal Domestic Assistance (CFDA) Titles

Not Applicable

11. Other Information

Not Applicable

II. AWARD INFORMATION

The Office of Naval Research anticipates awarding one or more contracts to be incrementally funded over a period of three years. The Phase I part of each award is anticipated to be between $550K and $650K. Option (Phase II) under the contract is anticipated to be between $2.5M and $3M for delivery and installation of the large-scale waterjet (7-8 MW), plus additional funding to cover other demonstrator costs.

III. ELIGIBILITY INFORMATION

Awards will be limited to team(s) which have the capability to manufacture a prototype demonstrator (7-8 MW), full-scale waterjet (36-40 MW) and test the prototype demonstrator within the United States. The Government permits teaming arrangements between and among the following groups: domestic and foreign companies, universities and institutions. Teaming with NSWC Carderock Division is prohibited due to potential conflicts of interest.

IV. APPLICATION AND SUBMISSION INFORMATION

1. Application and Submission Process –

Full Proposals - The due date for receipt of Full Proposals is 2:00 p.m. (EDT) on 1 May 2006. It is anticipated that final selections for the Phase I contract will be made by 2 June 2006. As soon as the final proposal evaluation process is completed, the Offeror will be notified via email or letter of its selection or non-selection for an award.

This BAA constitutes all the information to be provided regarding this solicitation. No Pre-Proposal Industry Days are anticipated prior to the proposal submission date.

2. Content and Format of Full Proposals –

The Proposals submitted under this BAA are expected to be unclassified. The Proposal submissions will be protected from unauthorized disclosure in accordance with FAR 15.207, applicable law, and DoD/DoN regulations. Offerors are expected to appropriately mark each page of their submission that contains proprietary information.

Full Proposal Format – VOLUME 1 - Technical and VOLUME 2 - Cost Proposal

- Paper Size – 8.5 x 11 inch paper, also will allow up to 11X17 inch paper for schedule and/or design concept foldouts
- Margins – 1" inch
- Spacing – single or double-spaced
- Font – Times New Roman, 12 point
- Number of Pages – Volume 1 is limited to no more than 50 pages, including the Statement of Work. Volume 2 does not have a page limitation. Double sided printing is encouraged. The Cover Page, Table of Contents and Resumes are excluded from the page limitations. Full Proposals exceeding the page limit may not be evaluated.
- Copies – one (1) printed original, two (2) hard copies, and seven (7) copies on CD-ROMs (in .PDF and .DOC (Word) format). In CD-ROMs, each Volume, including Appendices (if any), should be contained in a single file, NOT in segmented files.

Full Proposal Content

VOLUME 1: Technical Proposal

Cover Page:

This should include the words "Technical Proposal" and the following:

1) BAA number
2) Title of Proposal

3) Identity of Prime Offeror and complete list of subcontractors, if applicable
4) Technical contact (name, address, phone/fax, electronic mail address)
5) Administrative/business contact (name, address, phone/fax, electronic mail address)
6) Duration of effort (differentiate Phase I and Phase II)

Table of Contents: (not included in page count)

Statement of Work: A Statement of Work (SOW) clearly detailing the scope and objectives of the program, design procedure, and the technical approach to be taken to meet the performance requirements, broken out by phase. It is anticipated that the proposed SOW will be incorporated as an attachment to the resultant award instrument. To this end, such proposals must include a severable self-standing SOW without any proprietary restrictions, which can be attached to the contract award. Include a detailed listing of the technical tasks/subtasks organized by month and phase.

Project Schedule and Milestones: The proposal should include a detailed listing of the technical tasks/subtasks in Work Breakdown Structure format broken out by phase and month. The proposal should also include a schedule of events and milestones for the proposed program keyed to the work breakdown structure, month, and program phases. Deliverables and program review dates should be included.

Assertion of Data Rights: Include here a summary of any proprietary rights to pre-existing results, prototypes, or systems supporting and/or necessary for the use of the research, results, and/or prototype. Any data rights asserted in other parts of the proposal that would impact the rights in this section must be cross-referenced. *If there are proprietary rights, the Offeror must explain how these affect its ability to deliver research data, subsystems and toolkits for integration. Additionally, Offerors must explain how the program goals are achievable in light of these proprietary limitations.* If there are no claims of proprietary rights in pre-existing data, this section shall consist of a statement to that effect.

Deliverables: A detailed description of the results and products to be delivered for each phase of the program.

Management Approach: A discussion of the overall approach to the management of this effort, including brief discussions of the total organization; use of personnel; project/function/subcontractor relationships; government research interfaces; and planning, scheduling and control practice. Identify which personnel and subcontractors (if any) will be involved in each program phase. Include a description of the facilities that are required for the proposed effort with a description of any Government Furnished Equipment/Hardware/Software/Information required, by version and/or configuration.

Experience: A description of the experience and qualifications of the offeror, subcontractors, and key personnel relevant to the proposed effort. Specific examples of work accomplished similar in complexity, magnitude and technical content to that

proposed should be provided. Brief resumes (Not Included in Page Limitations) of key prime and subcontractor personnel should be included.

VOLUME 2: Cost Proposal

The Cost Proposal shall consist of a cover page and two parts, Part 1 will provide a detailed cost breakdown of all costs for each phase by cost category by month and Part 2 will provide a cost breakdown by task/sub-task corresponding to the task numbers in the proposed Statement of Work. The cost proposal for Phase II will be further definitized in the Phase I deliverable describing the awardee's revised proposal for Phase II development.

Cover Page: The use of the SF 1411 is optional. The words "Cost Proposal" should appear on the cover page in addition to the following information:

- BAA number
- Title of Proposal
- Identity of prime Offeror and complete list of subcontractors, if applicable
- Technical contact (name, address, phone/fax, electronic mail address)
- Administrative/business contact (name, address, phone/fax, electronic mail address) and
- Duration of effort (separately identify Phase I and Phase II)

Part 1: For each Phase (particularly Phase I), detailed breakdown of all costs by cost category and month:

- Direct Labor – Individual labor category or person, with associated labor hours and unburdened direct labor rates
- Indirect Costs – Fringe Benefits, Overhead, G&A, COM, etc. (Must show base amount and rate)
- Travel – Number of trips, destination, duration, etc.
- Subcontract – A cost proposal as detailed as the Offeror's cost proposal will be required to be submitted by the subcontractor. The subcontractor's cost proposal can be provided in a sealed envelope with the Offeror's cost proposal or will be requested from the subcontractor at a later date
- Consultant – Provide consultant agreement or other document which verifies the proposed loaded daily/hourly rate
- Materials should be specifically itemized with costs or estimated costs. An explanation of any estimating factors, including their derivation and application, shall be provided. Include a brief description of the Offeror's procurement method to be used (Competition, engineering estimate, market survey, etc.)
- Other Directs Costs, particularly any proposed items of equipment or facilities. Equipment and facilities generally must be furnished by the contractor/recipient. (Justifications must be provided when Government funding for such items is sought). Include a brief description of the Offeror's procurement method to be used (Competition, engineering estimate, market survey, etc.)

- Fee/Profit including fee percentage.

Part 2: For each Phase (particularly Phase I), cost breakdown by task/sub-task using the same task numbers in the Statement of Work.

3. Significant Dates and Times –

Anticipated Schedule of Events*		
Event	**Date (MM/DD/YEAR)**	**Time (EDT)**
Full Proposals Due Date	05/01/06	2:00 pm
Notification of Selection for Phase I Awards	*05/15/06	2:00 pm
Phase I Contract Awards	*07/17/06	2:00 pm
Phase I Delivery (model hardware)	*11/30/06	2:00 pm
Phase I Delivery (Phase II proposal)	*02/16/07	2:00 pm
Notification of Selection for Phase II Award	*05/07/07	
Phase II Contract Award	*06/01/07	2:00 pm
Phase II Delivery (hardware)	*05/30/08	2:00 pm
Phase II Delivery (hardware installation)	*08/30/08	2:00 pm
Phase II Report Due	*10/30/08	2:00 pm
Completion of At-Sea Tests	*11/28/08	2:00 pm

***These dates are estimates as of the date of this announcement.**

4. Submission of Late Proposals –

Any proposal, modification, or revision, that is received at the designated Government office after the exact time specified for receipt of proposals is "late" and will not be considered unless it is received before award is made, and the contracting officer determines that accepting the late proposal would not unduly delay the acquisition and

a) If it was transmitted through an electronic commerce method authorized by the announcement, it was received at the initial point of entry to the Government infrastructure not later than 5:00 p.m. one working day prior to the date specified for receipt of proposals; or
b) There is acceptable evidence to establish that it was received at the Government installation designated for receipt of proposals and was under the Government's control prior to the time set for receipt of proposals; or
c) It was the only proposal received.

However, a late modification of an otherwise timely and successful proposal, that makes its terms more favorable to the Government will be considered at any time it is received and may be accepted.

Acceptable evidence to establish the time or receipt at the Government installation includes the time/date stamp of that installation on the proposal wrapper, other documentary evidence of receipt maintained by the installation, or oral testimony or statements of Government personnel.

If an emergency or unanticipated event interrupts normal Government processes so that proposals cannot be received at the Government office designated for receipt of proposals by the exact time specified in the announcement, and urgent Government requirements preclude amendment of the announcement closing date, the time specified for receipt of proposals will be deemed to be extend to the same time of day specified in the announcement on the first work day on which normal Government processes resume.

The contracting officer must promptly notify any offeror if its proposal, modifications, or revision was received late and must inform the offeror whether its proposal will be considered.

5. Address for the Submission of Full Proposals –

Office of Naval Research
875 N. Randolph Street Suite 1425
Arlington, VA 22203-1995
Attn: Dr. Ki-Han Kim
Room 607
Telephone Number: (703) 696 - 4305

NOTE: PROPOSALS SENT BY FAX OR E-MAIL WILL NOT BE CONSIDERED.

V. EVALUATION INFORMATION

1. Evaluation Criteria –

The following evaluation criteria apply to the Full Proposals. Proposals will be selected through a technical/scientific decision process. Criteria A-D are listed in descending order of priority. Any sub criteria listed under A-D are of equal importance to each other.

A. Overall scientific and technical merits of the proposal.

1. The soundness of technical concept with regard to meeting the requirements detailed in *Section I.6 – Performance Requirements of the Compact High-Power-Density Waterjet.*
2. Approach and Plan outlined for developing the technology to meet these requirements for both Phase I (Base) and Phase II (Option).
3. The offeror's awareness of the state-of-the-art and understanding of scope of the problem the Government's objectives for this program.

B. Team Qualifications (Offeror and Subcontractors)

1. Capability to manufacture prototype (7-8 MW) and full-scale (up to 40 MW) waterjet unit
2. Technical capabilities in the area of waterjet simulation, design, and analysis
3. Facilities, software tools, and other resources that will contribute to the offeror's ability to conduct tradeoff studies and validate the merits of its design
4. Related experience and/or past performance in development of advanced waterjet technology.

C. Schedule and Cost Realism

The objective of this criterion is to establish that the proposed schedule and costs are reasonable and realistic for the technical and management approach offered, as well as to determine the offeror's practical understanding of the effort. This will be principally measured by cost per labor-hour and number of labor-hours proposed. Cost reduction approaches that will be received favorably include innovative management concepts that maximize direct funding for the prototype and limit diversion of funds into overhead. Particular emphasis will be placed upon the Base (Phase I) proposal, though attention will also be given to the offeror's initial plan, schedule and cost proposal for the Option (Phase II) work.

D. Other Factors

For proposed awards to be made as contracts to large businesses, the socio-economic merits of each proposal will be evaluated based on the extent of the Offeror's commitment in providing meaningful subcontracting opportunities for small businesses, small disadvantaged businesses, woman-owned small businesses, HUBZone small businesses, veteran-owned small businesses, service disabled veteran-owned small businesses, historically black colleges and universities, and minority institutions.

2. Evaluation Panel –

Government technical experts from the Office of Naval Research and other Federal entities will perform the evaluation of proposals. The Government may use selected non-government personnel or support contractor personnel to assist in the evaluation and administrative functions of any proposals ensuing from this solicitation. Such non-government personnel will be bound by appropriate non-disclosure agreements to protect proprietary and source-selection information.

VI. AWARD ADMINISTRATION INFORMATION

1. Administrative Requirements –

The North American Industry Classification System (NAICS) code – The North American Industry Classification System (NAICS) code for this announcement is 541710 with a small business size standard of 500 employees

CCR - Successful Offerors not already registered in the Central Contractor Registry (CCR) will be required to register in CCR prior to award of any grant, contract, cooperative agreement, or other transaction agreement. Information on CCR registration is available at http://www.onr.navy.mil/02/ccr.htm.

Certifications – Proposals should be accompanied by a completed certification package which can be accessed on the ONR Home Page at Contracts & Grants. For contract proposals, the certification package is entitled, "Representations and Certifications for Contracts."

Subcontracting Plans - Successful contract proposals that exceed $500,000, submitted by all but small business concerns, will be required to submit a Small Business Subcontracting Plan in accordance with FAR 52.219-9, prior to award.

2. Reporting and Deliverables

Specific deliverables should be proposed by the offeror and will be finalized with the technical program officer and the contract specialist. Reports and hardware deliverables that the Government anticipates for the proposed program are as follows:

Administrative

- Monthly technical and financial status reports.
- Detailed schedule for the total program.
- Quarterly progress review presentation material and record of meeting.

Phase I - Pump Design, Model Scale Fabrication, and Large Scale Demonstration Plan:

- Detailed design report and pump drawings. The design report should include the design procedure used and performance predictions.
- IGES file containing blade surface geometry
- Principal pump dimensions (full scale)
  - Inlet diameter
  - Rotor leading edge and trailing edge diameters
  - Maximum internal diameter
  - Maximum rotor hub diameter
  - Nozzle discharge diameter
  - Mounting flange diameter

  - Number of rotor and stator blades
  - Rotor and stator solidities
- Principal velocities evaluated at the speeds shown in Table 1
  - Ship speed
  - Rotation rate (RPM)
  - Flow rate
  - Jet velocity
  - Head rise across pump
  - Net Positive Suction Head (NPSH)
  - Specific Speed (Ns)
  - Suction Specific Speed (Nss)
- Performance evaluated at the speeds shown in Table 1
  - Momentum thrust
  - Inlet loss coefficient
  - Nozzle loss coefficient
  - Required power
  - Pump efficiency
  - Propulsive efficiency
- Model-scale hardware
  - One (1) high strength aluminum, brass, or bronze model (12 inch internal casing diameter).
- Updated and complete Phase II proposal including large scale demonstration plan – This should include identification of appropriate demonstration platform, waterjet installation and operational plan, costs, and schedule.

Phase II - Large Scale (7 – 8 MW) At Sea Demonstrations:

- Detailed design report and drawings. The design report should include the design procedure used and performance predictions.
- IGES file containing blade surface geometry
- Principal dimensions of the large-scale (7-8 MW) waterjet prototype
  - Inlet diameter
  - Rotor leading edge and trailing edge diameters
  - Maximum internal diameter
  - Maximum rotor hub diameter
  - Nozzle discharge diameter
  - Mounting flange diameter
  - Number of rotor and stator blades
  - Rotor and stator solidities
- Principal velocities at the speeds specified in Table 1
  - Ship speed
  - Rotation rate (RPM)
  - Flow rate
  - Jet velocity
  - Head rise across pump
  - Net Positive Suction Head (NPSH)
  - Specific Speed (Ns)

  - Suction Specific Speed (Nss)
- Performance at the speeds specified in Table 1
  - Momentum thrust
  - Inlet loss coefficient
  - Nozzle loss coefficient
  - Required power
  - Pump efficiency
  - Propulsive efficiency
- Large-scale waterjet installation plan and drawing
- Large-scale waterjet and hardware

VII. OTHER INFORMATION

1. Government Property/Government Furnished Equipment (GFE) and Facilities

Each proposer must provide a very specific description of any equipment/hardware that it needs to acquire to perform the work. This description should indicate whether or not each particular piece of equipment/hardware will be included as part of a deliverable item under the resulting award. Also, this description should identify the component, nomenclature, and configuration of the equipment/hardware that it proposes to purchase for this effort. It is the Government's desire to have the contractors purchase the equipment/hardware for deliverable items under their contract. The purchase on a direct reimbursement basis of special test equipment or other equipment that is not included in a deliverable item will be evaluated for allowability on a case-by-case basis. Maximum use of Government integration, test, and experiment facilities is encouraged in each of the Offeror's proposals.

Government research facilities and operational military units are available and should be considered as potential government furnished equipment/facilities. These facilities and resources are of high value and some are in constant demand by multiple programs. It is unlikely that all facilities would be used for this topic. The use of these facilities and resources will be negotiated as the program unfolds. Offerors should explain which of these facilities they recommend.

2. BAA Questions and Answers

During the solicitation period, potential responders will be able to ask questions pertaining to this BAA via the Business Contact referenced in paragraph I.7.

All Questions are due by no later than 2:00 pm (Eastern Daylight Time) on 10 April 2006. Responses will be posted on 19 April 2006.

All questions received and their respective answers will be posted so that all potential bidders can benefit from the information posted.